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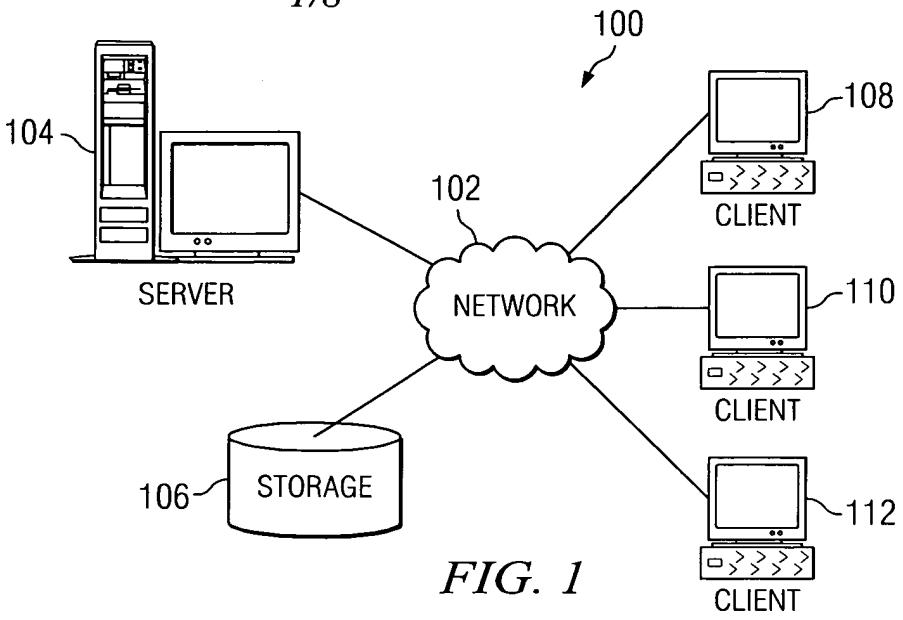
100
104
SERVER
102
NETWORK
108
CLIENT
110
CLIENT
112
CLIENT
106
STORAGE

FIG. 1

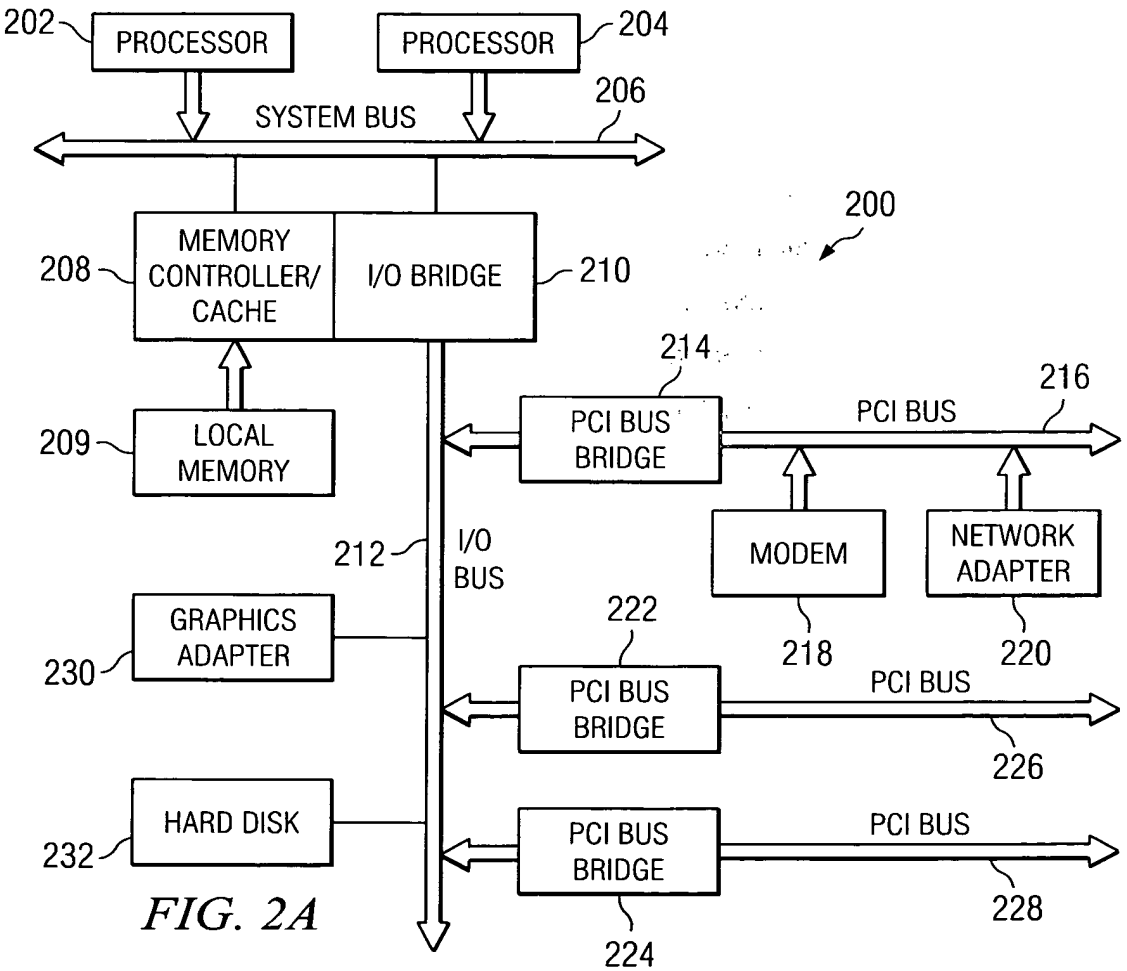
202
PROCESSOR
PROCESSOR
204
206
SYSTEM BUS
200
208
MEMORY CONTROLLER/ CACHE
I/O BRIDGE
210
214
216
209
LOCAL MEMORY
PCI BUS BRIDGE
PCI BUS
212
I/O BUS
MODEM
NETWORK ADAPTER
222
230
GRAPHICS ADAPTER
218
220
PCI BUS BRIDGE
PCI BUS
226
232
HARD DISK
PCI BUS BRIDGE
PCI BUS
228
224

FIG. 2A

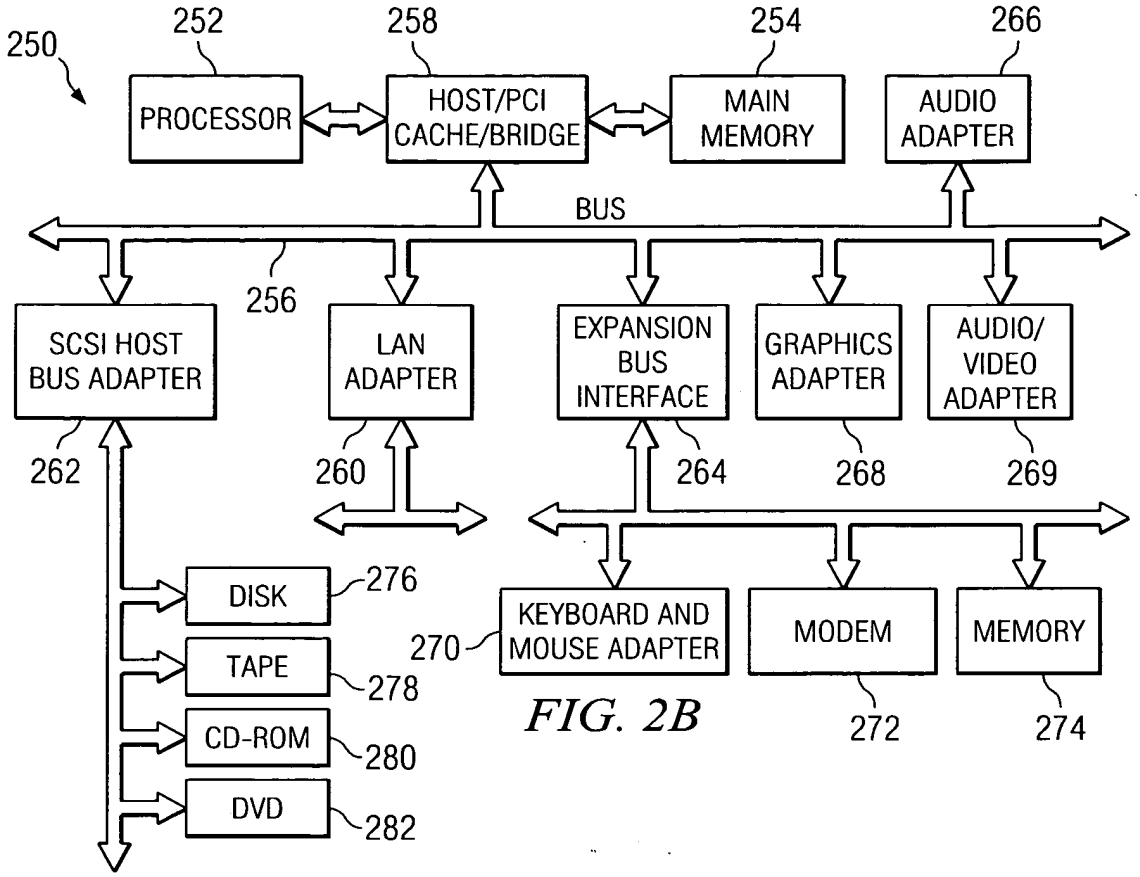

FIG. 2B

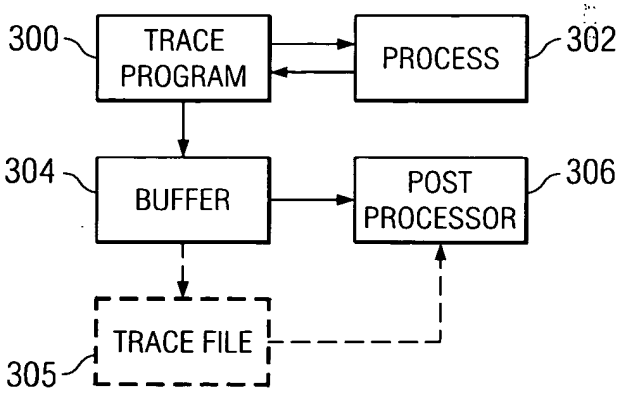

FIG. 3

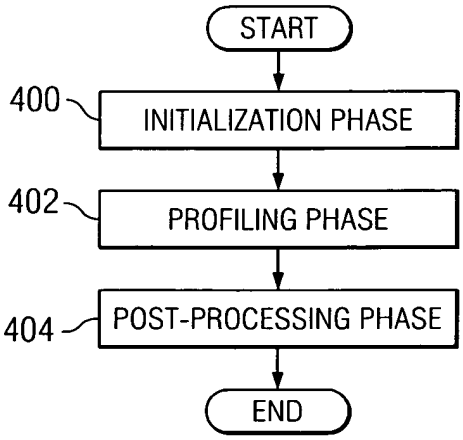

FIG. 4

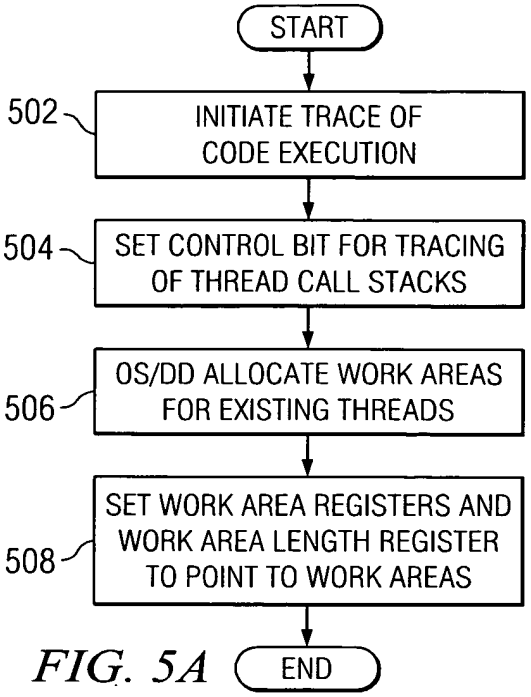

FIG. 5A

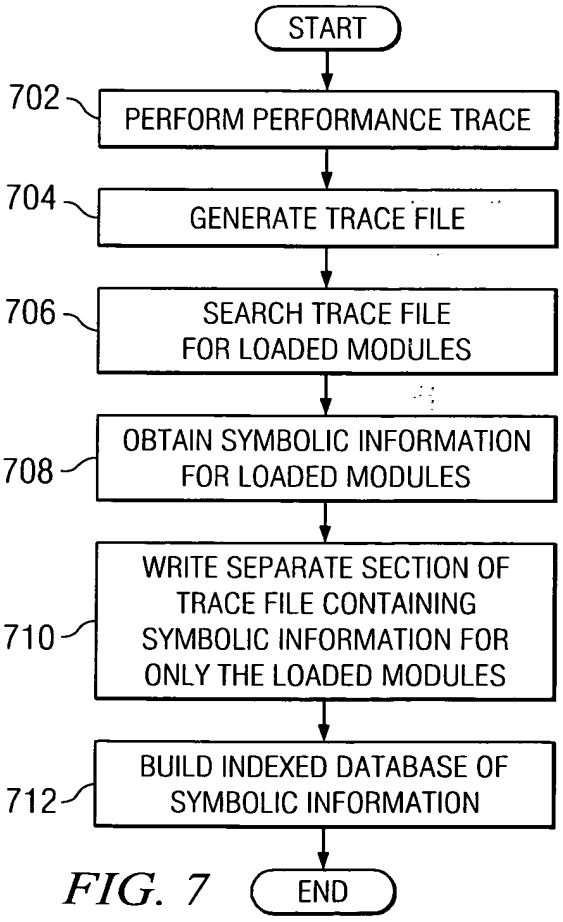

FIG. 7

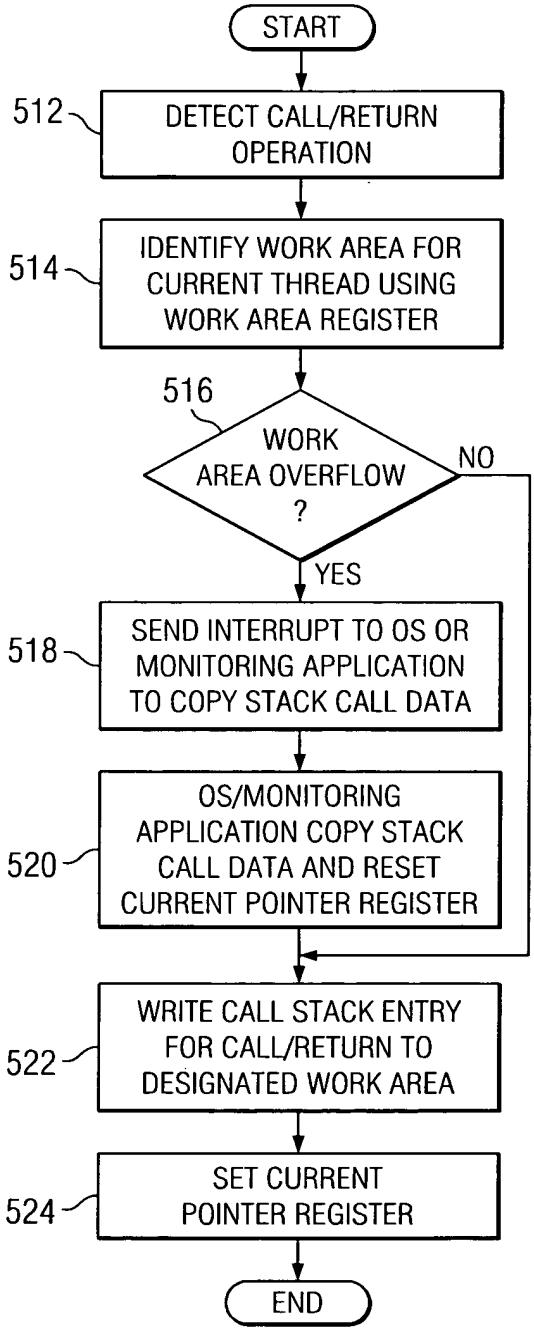

FIG. 5B

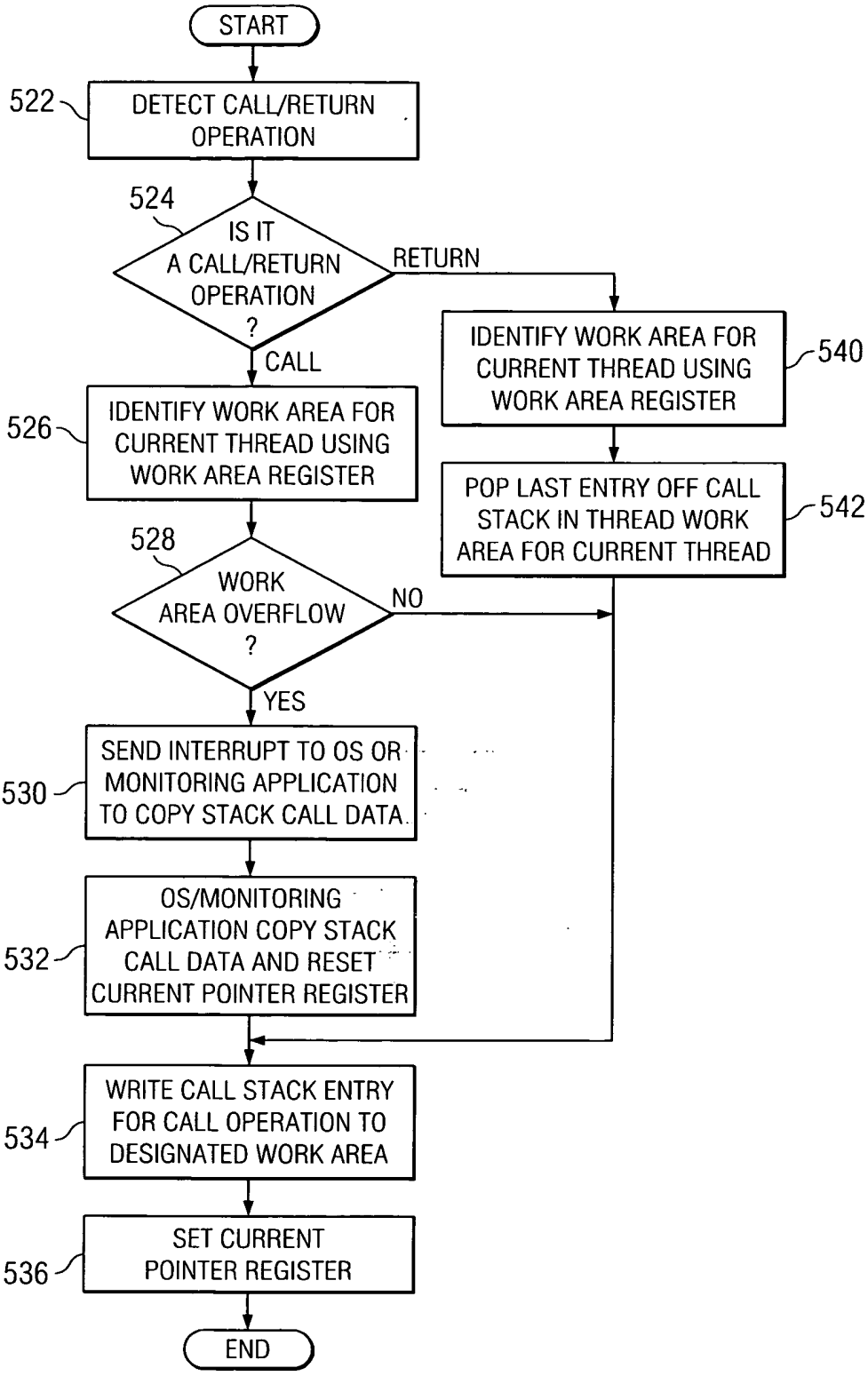
START
522
DETECT CALL/RETURN OPERATION
524
IS IT A CALL/RETURN OPERATION ?
RETURN
CALL
526
IDENTIFY WORK AREA FOR CURRENT THREAD USING WORK AREA REGISTER
528
WORK AREA OVERFLOW ?
NO
YES
530
SEND INTERRUPT TO OS OR MONITORING APPLICATION TO COPY STACK CALL DATA
532
OS/MONITORING APPLICATION COPY STACK CALL DATA AND RESET CURRENT POINTER REGISTER
534
WRITE CALL STACK ENTRY FOR CALL OPERATION TO DESIGNATED WORK AREA
536
SET CURRENT POINTER REGISTER
END
540
IDENTIFY WORK AREA FOR CURRENT THREAD USING WORK AREA REGISTER
542
POP LAST ENTRY OFF CALL STACK IN THREAD WORK AREA FOR CURRENT THREAD

FIG. 5C

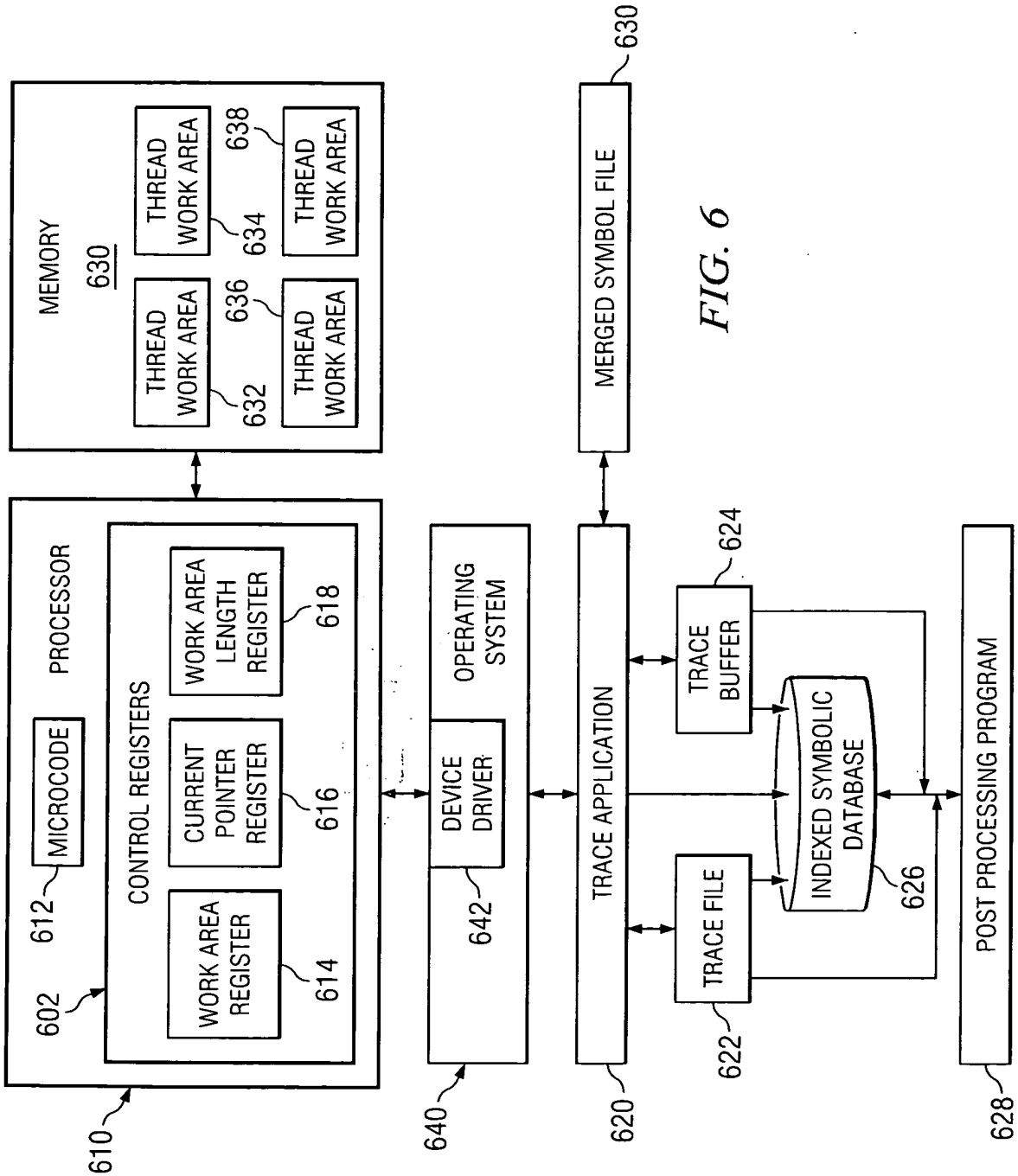
MEMORY
630
THREAD WORK AREA
632
THREAD WORK AREA
634
THREAD WORK AREA
636
THREAD WORK AREA
638
PROCESSOR
MICROCODE
612
CONTROL REGISTERS
WORK AREA REGISTER
614
CURRENT POINTER REGISTER
616
WORK AREA LENGTH REGISTER
618
602
610
DEVICE DRIVER
642
OPERATING SYSTEM
640
MERGED SYMBOL FILE
630
TRACE APPLICATION
620
TRACE BUFFER
624
TRACE FILE
622
INDEXED SYMBOLIC DATABASE
626
POST PROCESSING PROGRAM
628

FIG. 6

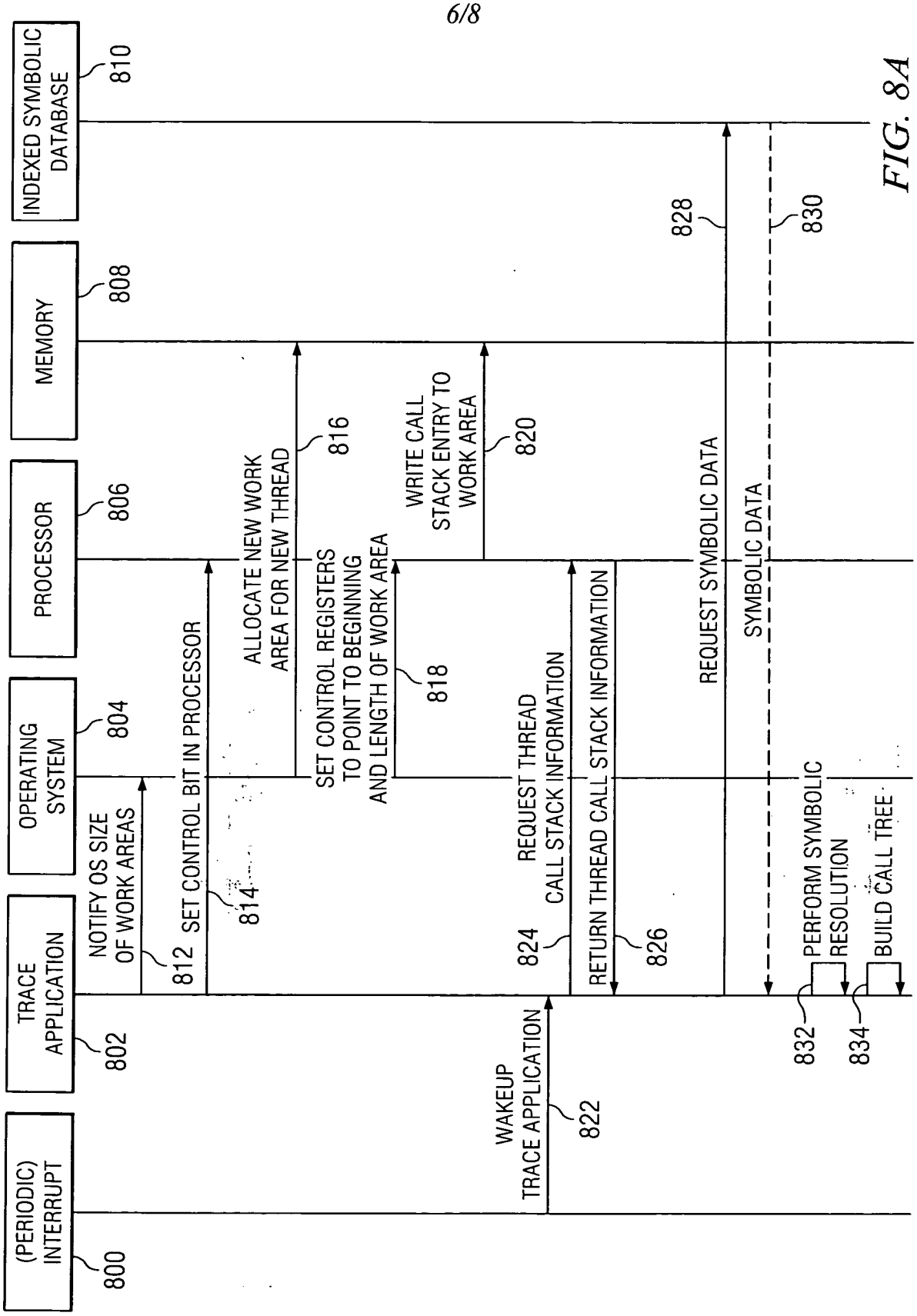
(PERIODIC) INTERRUPT
800
TRACE APPLICATION
802
OPERATING SYSTEM
804
PROCESSOR
806
MEMORY
808
INDEXED SYMBOLIC DATABASE
810
NOTIFY OS SIZE OF WORK AREAS
812
SET CONTROL BIT IN PROCESSOR
814
ALLOCATE NEW WORK AREA FOR NEW THREAD
816
SET CONTROL REGISTERS TO POINT TO BEGINNING AND LENGTH OF WORK AREA
818
WRITE CALL STACK ENTRY TO WORK AREA
820
WAKEUP TRACE APPLICATION
822
REQUEST THREAD CALL STACK INFORMATION
824
RETURN THREAD CALL STACK INFORMATION
826
REQUEST SYMBOLIC DATA
828
SYMBOLIC DATA
830
PERFORM SYMBOLIC RESOLUTION
832
BUILD CALL TREE
834

FIG. 8A

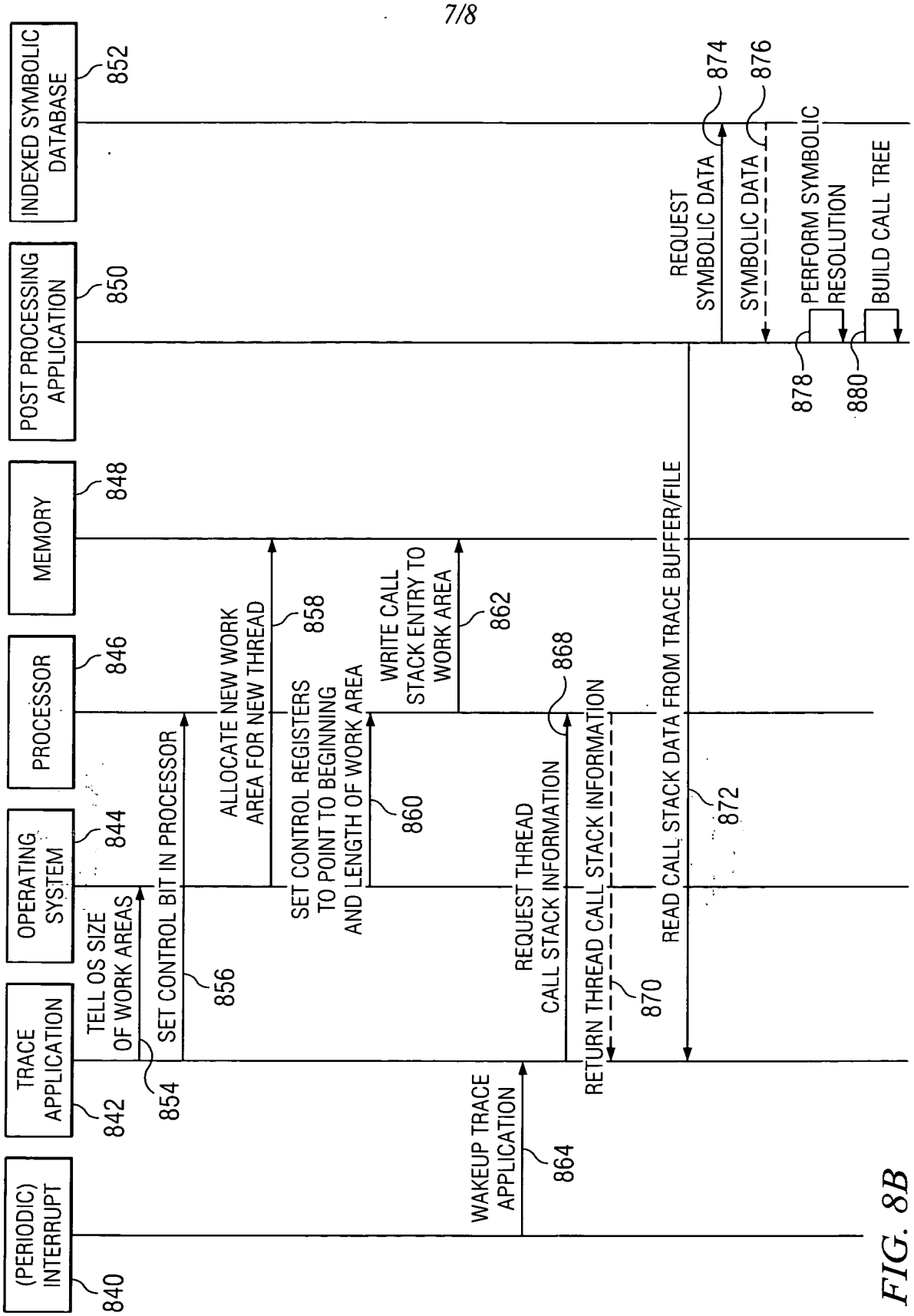
(PERIODIC) INTERRUPT
840
TRACE APPLICATION
842
OPERATING SYSTEM
844
PROCESSOR
846
MEMORY
848
POST PROCESSING APPLICATION
850
INDEXED SYMBOLIC DATABASE
852
TELL OS SIZE OF WORK AREAS
854
SET CONTROL BIT IN PROCESSOR
856
ALLOCATE NEW WORK AREA FOR NEW THREAD
858
SET CONTROL REGISTERS TO POINT TO BEGINNING AND LENGTH OF WORK AREA
860
WRITE CALL STACK ENTRY TO WORK AREA
862
WAKEUP TRACE APPLICATION
864
REQUEST THREAD CALL STACK INFORMATION
868
RETURN THREAD CALL STACK INFORMATION
870
READ CALL STACK DATA FROM TRACE BUFFER/FILE
872
REQUEST SYMBOLIC DATA
874
SYMBOLIC DATA
876
PERFORM SYMBOLIC RESOLUTION
878
BUILD CALL TREE
880

FIG. 8B

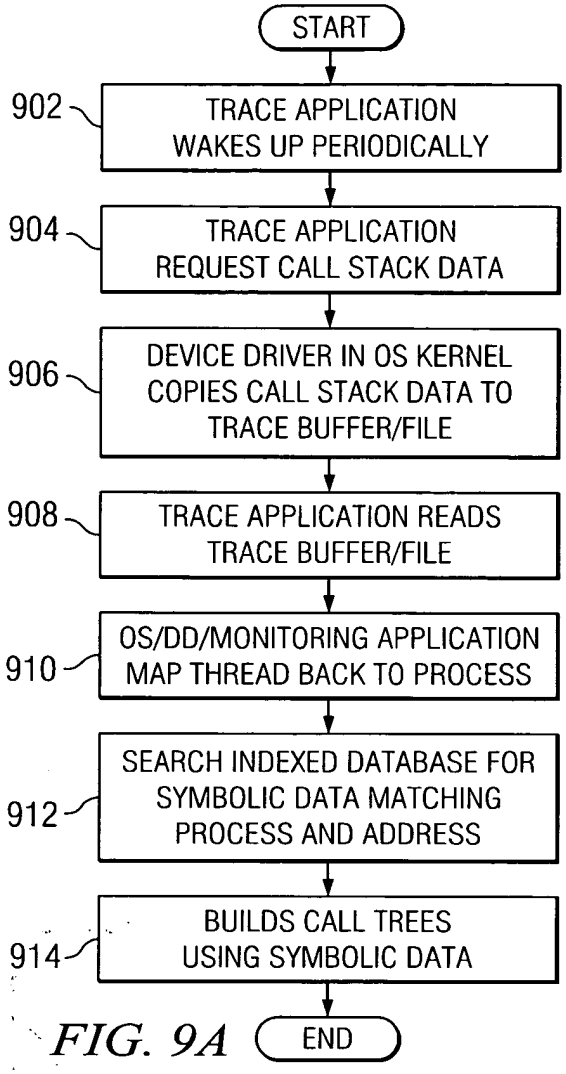

FIG. 9A

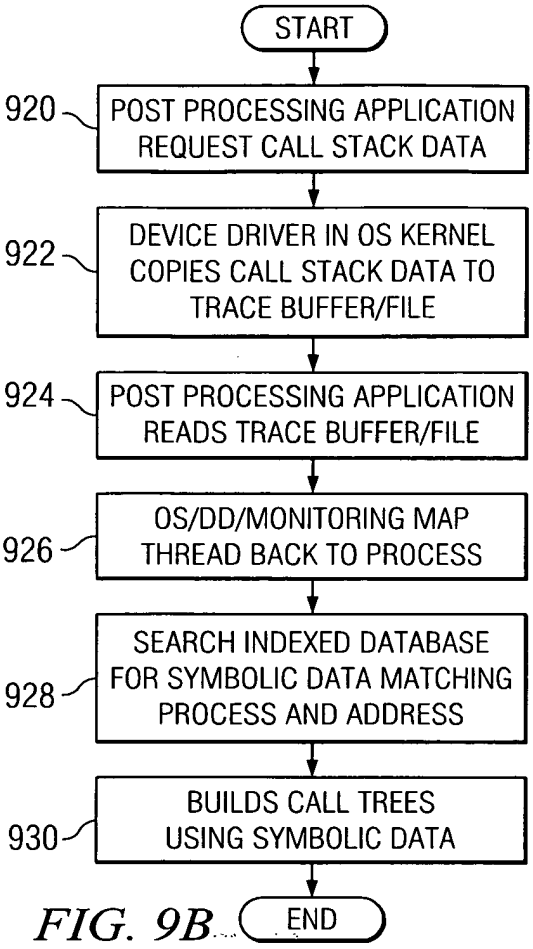

FIG. 9B

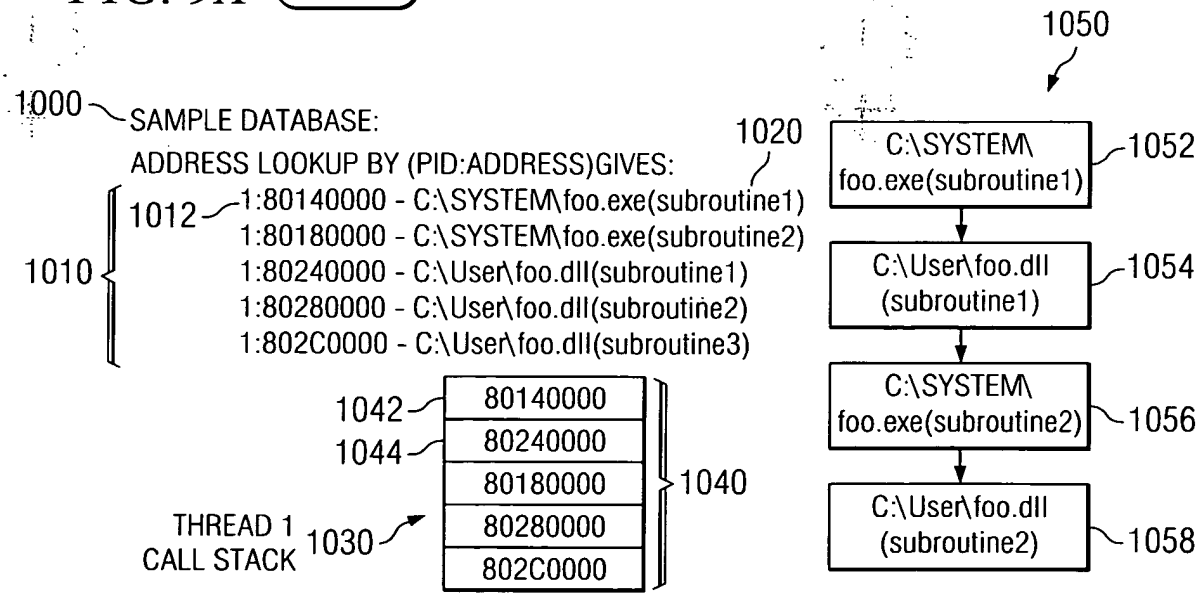

FIG. 10